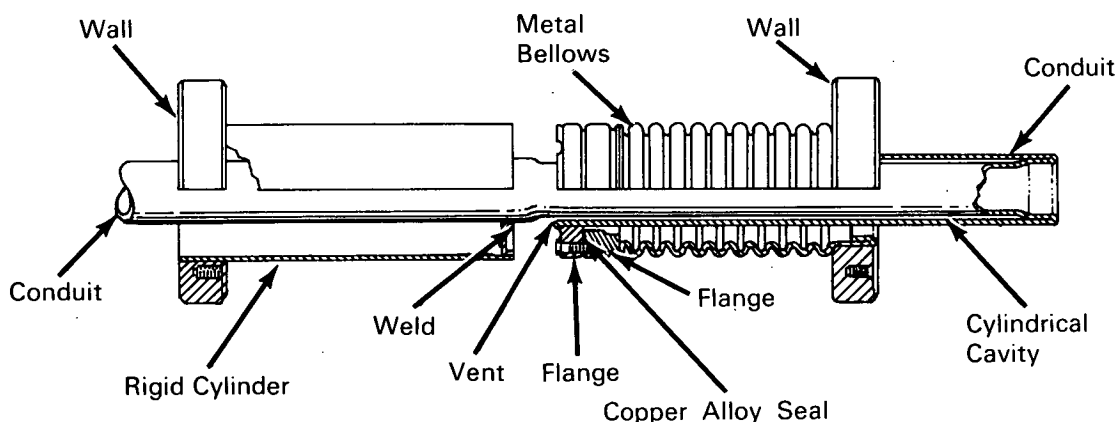


NASA TECH BRIEF



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Feed-Thru Conduit Minimizes Heat Pickup



The problem:

To design an insulated feed-thru conduit which will minimize heat pickup by a cryogenic fluid passing through the walls of a double high-vacuum chamber. The feed-thru conduit must also be capable of expansion and contraction with the walls of the chamber. Previous systems had curved conduit interconnections between the tank walls to allow for expansion, but excessive heat pickup resulted from conduction around the conduit.

The solution:

A straight through conduit utilizing a bellows and rigid cylinder to provide a low loss feed-thru for cryogenic liquid passing into a high vacuum chamber.

How it's done:

The straight through conduit has a bellows for linear expansion and contraction within the walls of the vacuum chamber. One end of the bellows is connected to one wall; the other is sealed and clamped to the conduit. Thus, a cold chamber surrounds about

one-half the length of the conduit. A rigid cylinder surrounds the other half of the conduit, thermally isolating it from the wall by means of the long thermal conductive path from the wall to the connection on the conduit. The rigid cylinder is welded to the conduit close to the bellows and conduit seal. A cylindrical cavity under the outer shell of the conduit provides additional insulation. This is vented to the guard vacuum between the two walls.

Notes:

1. The feed-thru system was designed to feed liquid helium into a cryopump and it is applicable to high vacuum systems and to the storage of all cryogenes.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: B67-10619

(continued overleaf)

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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